

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-II Examination July 2010****Subject code: 721203****Subject Name: Design of Canal Network and Regulation Work****Date: 07 /07 /2010****Time: 11.00am – 1.30pm****Instructions:****Total Marks: 60**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss Lacey's regime theory and mention limitations of Lacey's theory. **06**
 (b) Explain Khosla's method of independent variables. **06**
Q.2 (a) Describe the design procedure of straight Glacis fall. **06**
 (b) Design a concrete lined channel to carry a discharge of 300 cumecs at a slope of 1 in 4900. The side slopes of the channel may be taken as 1.5H : 1V. The value of $n = 0.015$. assume limiting velocity in the channel as 2.0 m/s. **06**

OR

- (b) Design an irrigation channel in alluvial soil according to Lacey's silt theory for the discharge of 8 cumec, silt factor 0.9 and side slope 0.5 H : 1 V. **06**
Q.3 (a) Explain the terms Flexibility, Proportionality, Setting and Sensitivity as applied to modules. **06**
 (b) Design crest level and waterway for a barrage constructed on a river having discharge of 7500 cumecs, average bed level of the river 157 m, high flood level (before construction of barrage) 162.2 m, permissible afflux 1.0 m and pond level 160.6 m. **06**

OR

- Q.3** (a) What are CD works? What is the necessity of such works in canal project? Also explain Mitra's method of design of canal transitions. **06**
 (b) Design a pipe outlet for the following data : **06**
 Full supply discharge at the head of water course = 90 lit/s
 FSL in distributary = 105 m
 FSL in water course = 104 m
Q.4 (a) What do you understand by schedule of area statistics? How is it prepared? **06**
 (b) Design an irrigation canal using Kennedy's method to carry a discharge of 5 cumec. Assume $N = 0.0225$; $m = 1.0$ and $B/D = 3.24$ **06**

OR

- Q.4** (a) Draw a typical canal cross-section, partly in cutting and partly in filling. Discuss briefly it's various terms like berm, banks, dowla and spoil bank. **06**
 (b) Explain cistern element. **06**
Q.5 (a) What do you understand by launching apron? How is it design? **06**
 (b) Explain corrections for inclination of floor and interference of piles in the Khosla's method of independent variables. **06**

OR

- Q.5** (a) Explain the criteria adopted in designing the various components of a weir built on permeable foundations using Khosla's theory. **06**
 (b) Using Khosla's method, determine uplift pressure at various key points without applying corrections for the apron shown in fig. **06**

